

Notes.

THE Dyestuffs (Import Regulation) Bill was read for a third time in the House of Lords on December 23 and has been given Royal assent. The measure was referred to in the King's Speech at the close of the session as "the Act regulating the importation of dyestuffs, in order securely to establish the dyestuffs industry in this country."

We begin this week the publication of a Calendar of Scientific Pioneers, which it is proposed to continue throughout the year. There is inspiration as well as interest in the lives and work of the great men of science thus recalled to memory, and many readers will, we believe, welcome this additional feature in the columns of NATURE. The Calendar has been prepared by Engr.-Comdr. Edgar C. Smith, H.M. Dockyard, Devonport, who has for many years been engaged in compiling biographies of all leading contributors to the advancement of natural knowledge.

A GREAT earthquake on December 16 is reported from the province of Kansu, on the Upper Hoang-Ho, in north-west China. The city of Ping-liang was much damaged, and 2000 persons are said to have perished. Prof. H. H. Turner and Mr. J. J. Shaw, in the *Times* of December 28, give reasons for believing that this earthquake was the origin of the great seismic disturbance registered on December 16. With regard to the suggestion of an Alaskan origin referred to last week (p. 542), it may be of interest to recall the last great earthquakes in that country. They occurred on September 3 and 10, 1899, the latter being the more violent. Though the seismographic evidence implied an origin in or near Alaska, no direct evidence reached this country until September 26, when the *Times* of that date published a short account of the violent earthquakes in Yakutat Bay. The magnitude of the disturbance was not, however, realised until 1905, when Messrs. Tarr and Martin showed, from the evidence of dead barnacles and mussels still adhering to the cliffs, that the uplift of the crust was in one place as much as 47 ft. 4 in.

THE third half-yearly report on the progress of civil aviation has just been issued as a White Paper (Cmd. 1073). It is an interesting document in view of the prevailing conditions in the industry, and holds out hope of a more prosperous future. It is pointed out that regular air services have now been established from London to Paris, Brussels, and Amsterdam, and that passenger, mail, and goods traffic is increasing. The total number of aeroplane miles flown in the half-year ending September 30, 1920, is nearly 700,000, whilst the aggregate since May, 1919, exceeds 1,000,000. The number of passengers by air exceeds 30,000, whilst the goods carried weigh little less than 90 tons. In value the imported goods exceed 500,000*l.*, whilst the exports and re-exports are about half that amount. As part of the mail services, about 50,000 letters have passed each way between London-Paris, Brussels, and Amsterdam with a regularity which is notable. Of the three routes the best shows 94 per cent. of deliveries within three hours of schedule time, and the worst 76 per cent. As part of the organisation for further improving these records, it is stated

that the wireless direction-finding apparatus installed at Croydon has proved its value, enabling aircraft to correct their course in thick weather. The equipment of aircraft with apparatus for wireless telephony is extending, as it is found to be of considerable assistance to navigation. The fatal accidents are given as in the ratio of 1 per 50,000 miles flown or per 5000 passengers carried. The international character of flying is prominently brought out in a concise statement of activities in other countries than Britain, and shows a breadth of interest which will stimulate efforts to overcome the present difficulties experienced by those engaged in civil aviation.

H.M. STATIONERY OFFICE has published an Interim Report on Glass Bottles and Jars and Scientific Glassware, prepared by a Sub-Committee appointed by the Standing Committee on Trusts and adopted by the Standing Committee (Cmd. 1066, price 2*d.*). The section on scientific glassware is of great interest and importance to all scientific users. After pointing out that prior to the war the whole of the scientific glassware used in this country was imported from enemy countries, principally Germany, the Committee describes the efforts made by certain manufacturers of glass bottles, under inducements by the Government, to develop the scientific glassware industry in Great Britain. The report points out that British manufacturers have to meet to-day foreign competition the nature of which may be gathered from the fact that, "favoured by 'exchange' rates and other conditions, goods of the kind now being made in this country are being supplied by Continental manufacturers at prices less than the actual cost of manufacture here, whereas for goods that are not yet being manufactured here prices are being charged by the Continental makers which mean to the consumer approximately five times the pre-war price of such goods." Finally, after declaring that it is outside its functions to report on the demand of the industry for a prohibition of imports of scientific glassware except under licence, the Committee says: "We cannot refrain from expressing the hope that his Majesty's Government will not find it impossible to implement the verbal assurances said to have been given to manufacturers; for it would appear to be only in that way that this country can be saved from returning to the pre-war position of dependence upon foreign countries for their supplies. We would add that, in our view, at the same time users of such glassware should also be safeguarded as to prices, and that the desired assistance should only be given for a limited period, with powers of withdrawal if it were found that manufacturers were in any way inclined to take advantage of the situation by unduly raising prices."

THE Annual Report of the Chief Medical Officer, 1919-20, Ministry of Health, has recently been issued, being the first annual medical report of the Ministry of Health. The greater part of the volume is occupied with a survey of the general health, of epidemiology and infectious diseases, and of the work of the sections into which the Medical Department of the Ministry of Health is now divided. In the appendix to the

volume Dr. Monckton Copeman discusses the relationship of smallpox and alastrim in connection with an outbreak of an anomalous varioloid disease in Norfolk. The disease was introduced from some locality in the Mediterranean area, and, although undoubtedly of the nature of smallpox, would seem more closely to resemble that variety which has been studied in Brazil known as "alastrim." Sir David Semple also gives a brief account of rabies and of the various systems of anti-rabic inoculation.

THE Research Defence Society has published an essay on "Vaccination" by Dr. Mary Scharlieb. A brief history of smallpox inoculation and of Jenner's work on the introduction of vaccination is given, followed by a short account of the symptoms of unmodified smallpox. The "Leicester experiment" is next described and discussed at some length. Finally, the outbreaks of smallpox at Dewsbury, Ravens-thorpe, Gloucester, and Glasgow are referred to, and the influence of vaccination on the incidence and mortality of the disease is considered. The essay should be useful to those who desire to have evidence of the value of vaccination. The essay (together with others on the work of the Medical Research Committee, on the value of experiments on animals, and on the prevention of tetanus during the war, already noticed in these columns) may be obtained from the Secretary, 11 Chandos Street, W.1, price 2s. the set.

ANCIENT Oriental chemistry and its allied arts are discussed in the November issue of *Man* by Mr. Masumi Chikashige. The author begins with a review of ancient chemistry in Japan and China, consisting in the latter country of two parts: theories and gold-making, the latter having in its turn two aims, wealth and eternal life. He then passes on to the question of bronze in China and Japan, and supplies a series of analyses of its component elements. Finally, he describes the manner in which iron swords are forged. He concludes by saying: "We may recognise now some resemblance to damascened steel. If the Japanese learned this method of welding from the naturalised Chinese, where had the latter learnt their art? Whether it was their own, which made its way westward to Europe through India and eastward to Japan, or whether, on the contrary, they learned the art from India, is not now to be settled."

THE Asiatic Society of Bengal has published among its Memoirs (vol. vii., No. 3) an important paper by Mr. J. Hornell on "The Origins and Ethnological Significance of Indian Boat Designs." Surveying the shores of the Indian peninsula, Mr. Hornell describes, with good illustrations, the various types of boats now in use and many ceremonies in connection with their launching and employment, with a review of our knowledge of the ancient sea-trade with India. The most interesting part of the paper is an attempt to show how foreign influences have created or modified the types which exist at present. Thus he suggests that compound masts are essentially Mongoloid in origin, being seen to-day among Burmese, Indonesians, and the southern Chinese, and that on the west coast the use of the outrigger for coasting vessels was discarded at a comparatively early period under the influence of seamen from the Persian Gulf and the

Red Sea. Also, since the single outrigger and balance-board designs are both Polynesian in affinity, their general diffusion on one or the other of our Indian coasts points to the conclusion either that some of the coast-folk of India are closely allied to the races of Oceania or that it is due to trade relations. Inland boat designs are on a very different footing, the first and larger group having distinctly Egyptian affinities, and the other equally well-marked Babylonian relationship.

THE second volume of the Proceedings of the Lahore Philosophical Society, which forms a record of the papers read before the society during the years 1916-20, has been received. The first volume contained papers read during 1914-16; we gather that lack of funds has prevented the issue of this second volume until the present time, and that publication has now been made possible by a grant of money from the Punjab University. The present volume, of eighty pages, contains records of thirty-two papers, of which eight are printed *in extenso* and the remainder in abstract. The papers are of two kinds: records of original work and summaries of recent researches; the mathematical, physical, and biological sciences are all represented. The membership roll is about fifty, and meetings are held every month during the academical session. A society such as this fulfils an important function in the intellectual life of a comparatively remote and isolated community. While authors of original researches will presumably publish them in other periodicals as well as in these pages, the present volume forms an interesting record of the activities of a society on the successful foundation and continued existence of which the members are to be congratulated.

WE have recently received a small booklet dealing with a proprietary fluid which has been placed on the market under the name of "Solomia." It is claimed to destroy any large insect pest—aphids, bugs, spiders, caterpillars, worms, etc. Further, it is stated to be non-injurious to crops, fruit, or grass, and its efficacy to be unaffected by weather conditions. If "Solomia" can effectively carry out all that its promoters claim for it, there is no doubt that it is a very remarkable mixture.

IN the December issue of the *Entomologist's Monthly Magazine* Mr. F. W. Edwards writes on the British species of *Dixinae*. This subfamily includes a small number of gnat-like insects commonly regarded as constituting a family of their own. They are related both to mosquitoes (*Culicidae*) and to crane-flies (*Tipulidae*), and Mr. Edwards places them in the first-mentioned family. Their larvæ and pupæ are exclusively aquatic, and bear a rather close resemblance to those of *Anopheles* and its allies. The only genus is *Dixa*, which enjoys the position of never having had the validity of its name questioned, and, consequently, no synonym exists. Ten British species are recognised, but they have been so little collected that we have only a very vague idea as to their distribution in this country. In the same periodical Mr. J. E. Collin gives useful keys to the British species of the *Sylvaticus* group of the genus *Pipunculus*. Since Mr. Verrall dealt with them in his "British Flies"

(vol. viii.) further material has accumulated, rendering a revision of the genus necessary.

THE status of the rook in its relation to the farmer, fruit-grower, and forester is briefly reviewed by Dr. W. E. Collinge in the *Journal of the Ministry of Agriculture* for December. Dr. Collinge is of opinion that this bird has become too numerous, and, as a consequence of the stress of competition, it has taken to feeding upon cultivated crops. He contends that if repressive measures were put into force and carefully carried out the rook would soon assume its normal place again, and prove to be one of the most useful birds to the farmer in helping to control the larvæ of such injurious insects as click-beetles and crane-flies. The rook to-day, the author estimates, consumes about 80 tons of cereals, 32 tons of potatoes and roots, $7\frac{1}{2}$ tons of insects beneficial to the farmer, and 65 tons of injurious insects, slugs, snails, etc. This last item is significant, and suggests an extension of this analysis directed to show approximately how many tons of cereals, potatoes, and roots would have been consumed by the 65 tons of injurious insects and their offspring if they had not fallen a prey to the rook.

IN No. 15 of the Economic Proceedings of the Royal Dublin Society (November, 1920) Prof. G. H. Carpenter reports on the injurious insects and other animals observed in Ireland during the years 1916-18. Among the various pests mentioned are larvæ of a species of Bibionid fly which caused much damage in wheat-fields by feeding on the roots, and those of *Bibio Marci*, L., found attacking potatoes stored in a pit. The flax flea-beetle (*Longitarsus parvulus*, F.) caused serious injury to the flax crop during the three years under review, and it was found necessary to re-sow the crop in several localities, no method of control being referred to. Storehouse beetles (*Ptinus fur*, L., and *P. tectus*, Boield.) are recorded as devouring very varied substances. Those of the first-mentioned species are believed to have been introduced from Tasmania, and were noted in 1908 in a consignment of almonds, and in 1911 from stuffed birds. Early in 1918 *P. fur* was received from Dublin localities among seeds of henbane intended for sowing, while *P. tectus* was discovered in a chemist's store of casein. The report is adequately illustrated, but shorter than many of its predecessors, which is possibly accounted for by the war and by conditions in Ireland generally.

THE first Report of the National Institute of Agricultural Botany, recently issued, shows that encouraging progress is being made with the new scheme. The aim and policy of the institute are to develop new and reselected varieties of all kinds of farm crops and to "grow on" promising types until sufficient stocks are available for distribution through the seed trade to the farmer. Liberal financial assistance has been forthcoming, not only from private benefactors, but also from the seed trade and farming industry. As the official seed-testing station is to be incorporated with the institute, a building grant and loan were obtained from the Development Commis-

sion. It is now hoped to gain new subscribers to build an adequate maintenance fund. The headquarters of the institute, now rapidly approaching completion, are being erected at Cambridge, and include housing accommodation for a portion of the staff. The rest of the 36 acres of this site is available for trial grounds. In addition, the Hiam Farm at St. Ives (Huntingdonshire) (354 acres) will be used as a seed multiplication farm, and 39 acres of rich market-garden land at Ormskirk, Lancashire, are being developed as the potato testing station. Mr. Wilfred H. Parker has been appointed director of the National Institute, but the Seed Testing Station will retain its independence under its own director, and will be equipped to test all kinds of agricultural, garden, or forest seeds. It is hoped that the buildings will be ready for occupation by August, 1921, and arrangements are being made whereby the work of the institute will be carried on with the least possible delay.

THE possibility of a general world-wide sinking of sea-level to the extent of nearly 20 ft. during post-Glacial times is discussed by Prof. R. A. Daly in the Proceedings of the National Academy of Sciences (Washington) (vol. vi., No. 5), and at greater length in the *Geological Magazine* (vol. lvii., No. 672). Observations on coast-lines in many parts of the world show approximately this degree of emergence, and the facts appear to warrant belief in synchrony in the age of the strands. Prof. Daly, however, points out that the suggestion is published, not to express a fixed conclusion, but to invite criticism and to test the idea in different parts of the world. If this emergence is established throughout the world, its explanation cannot be found in a change in the earth's centre of gravity or in a change in its speed of rotation. Prof. Daly suggests an increase in the past in the volume of existing ice-caps as a possible explanation. He calculates that a thickening of the Antarctic ice-cap to the average amount of 700 ft. would lower the sea-level by about 20 ft. by the abstraction of water from the ocean basins.

A REPORT on two pilot-balloon ascents made at Shoeburyness by Mr. N. K. Johnson is published by the Meteorological Office as Professional Notes No. 13. Both ascents were made on February 18 last. It is claimed that the results indicate the limitations and uncertainty of the single-theodolite method of observation, while they show the accuracy obtainable in determining upper-wind velocities and directions by the double-theodolite method. The first ascent was observed for 74 minutes, and in 48 minutes had attained 26,400 ft. The balloon then apparently developed a leak, and sank continuously to 12,800 ft., when it was lost in a light bank of haze. The second ascent was started at 11.50 a.m., 85 minutes after the first ascent, and was followed for 116 minutes. The balloon rose to 32,000 ft. in 64 minutes, which is said to be in excellent agreement with the rate of ascent given by Dines's formula. It afterwards maintained a practically uniform height until the 93rd minute, and afterwards fell slowly to 27,000 ft., when it was lost to view. Both balloons

were followed by two theodolites 4290 ft. apart, and also by a range-finder. The results obtained from the range-finder are said to be very much less accurate than those given by the two theodolites, both the heights and the distances by the range-finder being consistently low by about 10 per cent.

MR. N. A. ALLEN read an interesting paper on the current density in the crater of the carbon arc to the Physical Society on December 10. By using an arc between a positive carbon and two negative carbons in the same plane, but inclined to the positive at 100° , he found that the crater was a circular plane which could be easily focussed on the screen and accurately measured. The distance between the carbons corresponded to the largest "silent" current. Ten minutes were allowed to elapse before a reading was taken, so that the crater had time to assume its normal size. Under these conditions Mr. Allen found that with a maximum inaccuracy of about 1 per cent. the area of the crater in millimetres was equal to the current in amperes multiplied by 1.34. The experiments were made with currents varying between 2.5 and 10 amperes.

A THIRTY-PAGE pamphlet on "Optical Methods in Control and Research Laboratories," just published by Messrs. A. Hilger, Ltd., will prove of great use to works physicists and chemists concerned in the determination of the refractive indices, absorptions, or optical rotatory powers of materials. As a rule, such determinations must be made on direct-reading instruments, but it is desirable that the observer should understand the principles of the instrument which he uses, and be able to tell at once when it has gone wrong and to set it right. The pamphlet contains tables of the ranges and sensibilities of the different types of instruments and gives numerous references to books and memoirs in which further information may be found.

THE October quarterly number of the Journal of the Society of Glass Technology contains an article by Dr. W. E. S. Turner on "Some Developments in the Study of Glass Technology in the Year 1919-20." Dr. Turner states that during the war this country produced chemical glass "second to none in the world so far as chemical resistance was concerned"; and that as regards optical glass, glasses superior to those produced at Jena have been made on a commercial scale in this country, and also in very great variety. If it were a question of quality only, Dr. Turner adds, then we could very reasonably hope to maintain our market intact. But the existing rates of exchange in certain foreign countries operate to the disadvantage of the industry in this country. The article reproduces the fourth annual report of the Delegacy for Glass Research, from which it appears that, besides a considerable output of research work, much has been done to resuscitate the educational work of the University of Sheffield in the department of glass technology. An appendix to the report gives a list of the researches either planned or already in progress. Many of these researches are in fields in which other scientific bodies, such as the National Physical Laboratory, the British Scientific

Instrument Research Association, and the Glass Research Association, are also working. The journal contains, besides several interesting papers communicated to the society, including one by Dr. George H. Miles on "The Human Factor in Industry," a useful section of abstracts and reviews.

THE report on the heating of buried electric cables which was presented to the Institution of Electrical Engineers on December 17 is of interest to men of science as well as to engineers. The thermal problems in connection with the cables are those principally considered, and important results have been obtained. For instance, it is proved that the thermal conductivity of the paper insulation used in high-tension cables is about three times as great as that of paraffin wax and practically constant. Hence to determine the temperature of the inner cores of the cables carrying given currents all that is necessary is to determine the thermal resistance of the earth in contact with the lead sheath. The thermal conductivity of earth containing 15 per cent. of moisture was found to be five times greater than that of the paper insulation. Hence by elementary calculations it is now possible to calculate the temperature rise of cables carrying given currents when laid in certain soils. A curious result found by one of the experimenters was that a cable when buried 4 ft. under the ground heated more than when it was only buried 1 ft. Hence the cooling by air convection of the heated ground in the latter case must have been appreciable. It is of interest to notice the close connection between the problem discussed in this report and the corresponding problems in connection with the electrostatic capacity and the current-flow in cables. Kelvin pointed this out eighty years ago.

A PAPER read by Engr.-Comdr. C. J. Hawkes at the meeting of the North-East Coast Institution of Engineers and Shipbuilders on November 26 contains a great deal of information derived from experiments on the injection and combustion of fuel-oil in Diesel engines. These experiments were carried out at the Admiralty Engineering Laboratory on both the solid-injection and air-injection systems. The engine experimented upon was a single-cylinder four-stroke engine having a piston of aluminium alloy, $14\frac{1}{2}$ in. diameter by 15 in. stroke, developing 100 brake-horse-power at 380 revolutions per minute. The paper is very long, and it is possible to make reference to one or two points only. One of the later tests with solid injection gave an average fuel consumption of just under 0.4 lb. per brake-horse-power per hour when developing 100 brake-horse-power at 380 revolutions per minute. The sprayer used in this test had five 0.016-in. holes, with flats, and a fuel-valve roller clearance of 0.003 in. In this test the piston had been fitted with an obturator ring, which proved beneficial. In all the tests the best all-round results were obtained from this sprayer. Taking the fuel-oils experimented with in these tests, it has been found that up to about 100 lb. per sq. in. mean indicated pressure the fuel consumption with solid injection is approximately the same as the fuel consumption with air injection at the same power and

speed after taking into account the power required to drive the injection compressor. On an i.h.p. basis the consumption is less with air injection, thus indicating that the combustion is better with air injection. Those interested in the dynamics of cam-driven valves will find much of value in the paper.

MR. D. BROWNLIE has made a survey of a large number of boiler plants, and in the *Chemical Trade Journal* for August-September he published the individual figures obtained relating to different industries. The details of the performance of sixty typical steam-boiler plants used in chemical works are tabulated, and he discusses their merits and demerits. Since these tests were not applied after careful preparation of the plants, they may be regarded as representative of normal working conditions. The true average net working efficiency for the whole sixty plants was found to be approximately 58 per cent., but the author's experience leads him to the conclusion that a modern plant run on scientific lines will give on the average 75 per cent. net working efficiency for continuous performance, a variation between 65 per cent. with purely refuse coal and 82½ per cent. with the best quality coal being approximately the limits

which should exist. If the average efficiency could be raised from 58 per cent. to 75 per cent., obviously a great saving would result, amounting to 285,000l. per annum on the sixty plants tested. The reasons given for the low results obtained are insufficiency of grate length, economiser capacity, use of superheaters, and insulating steam-pipe covering. Other causes are that the feed-water is not properly treated to avoid scale troubles, and that the combustion processes are not chemically controlled by the use of recorders. Brickwork and foundations, too, were found in a bad state of repair, with a consequent leakage of cold air. The author criticises the use of chimney draught and steam jets when mechanical draught would serve the same purpose more economically. His great insistence, however, is on the necessity for supervision of the plant according to modern scientific methods, and he proceeds to summarise the rigid system of record-taking, which he believes to be essential if the best results are to be obtained. A number of instruments useful for control purposes are mentioned by name, but, of course, their relative merits and demerits are not subjects which the author can deal with in a single article.

Our Astronomical Column.

SKJELLERUP'S COMET.—The following observation was secured by Prof. Barnard at the Yerkes Observatory:—G.M.T. December 18d. 21h. 55.6m., R.A. 9h. 22m. 13s., S. decl. 1° 37' 49". The following provisional orbit was deduced from the observations of December 13, 17, and 18:

$$\begin{aligned} T &= 1920 \text{ Dec. } 13^{\text{h}} 17^{\text{m}} 43^{\text{s}} \text{ G.M.T.} \\ \omega &= 343^{\circ} 47' 9'' \\ \Omega &= 107^{\circ} 39' 23'' \\ i &= 23^{\circ} 53' 10'' \end{aligned} \left. \vphantom{\begin{aligned} T \\ \omega \\ \Omega \\ i \end{aligned}} \right\} 1920^{\circ} 0$$

$\log q = 0.06439$

Ephemeris for Greenwich Midnight.

		R.A.	N. Decl.	log r	log Δ
		h. m. s.			
Dec.	31	10 19 36	17 4	0.0776	9.4769
Jan.	4	10 34 53	22 25	0.0838	9.4972
	8	10 48 33	27 16	0.0909	9.5220
	12	10 59 58	31 29	0.0989	9.5503
	16	11 9 40	35 10	0.1075	9.5799
	20	11 17 42	38 24	0.1167	9.6115

The comet will not become conspicuous, but should be readily visible until the moon interferes with observation towards the end of January.

THE JANUARY METEORS.—Mr. Denning writes:—"The shower of Quadrantids (or Boötids, as they are sometimes called) is due to recur on the nights of January 2 and 3, and it is likely to be conspicuously visible this year if the weather is clear, for there will be no interference from moonlight. The most favourable time to observe the shower will be in the few hours preceding sunrise or in the early evening. The strength of the shower apparently varies from year to year, but its visible character is much affected by moonlight and atmospheric conditions. The meteors are often brilliant and traverse long flights. In 1918 the radiant point seemed to be 7° or 8° north of the usual position, and the display appeared to be more abundant than usual."

THE MASSES OF THE STARS.—The growth of our knowledge of stellar masses has been slow; it was for a long time limited to the very few cases of

binaries the orbits and parallaxes of which were known. The next extension came through the spectro-scope, which demonstrated the binary character of Algol variables and the existence of the class of spectroscopic binaries. Although the individual masses of the latter could not be found without a knowledge of the inclination, the results could be used statistically, assuming a mean inclination. One product of this research was the fact that the B stars have large masses.

The idea occurred independently to Russell and Hertzsprung that double stars showing curvature of motion could be used statistically for mass-determination even when the arc described was so short that the orbit could not be deduced. Russell concluded that B stars and giant A stars had an average mass of eight times the sun's, while the mass of the other pairs was about double the sun's.

This latter result was provisionally adopted by J. Jackson and H. H. Furner in a paper read to the Royal Astronomical Society on December 10. They utilised all available orbits of binaries, and also several hundreds of other pairs the relative motion of which showed curvature. The parallax of each pair was deduced on the assumption that its mass was double the sun's; its linear motion was then deduced from its observed proper motion.

The resulting apex of the solar motion is R.A. 273.0°, decl. +33.8°, and speed 19.13 km./sec.; the latter is so close to Campbell's spectroscopic value, 19.5 km./sec., that it fully confirms the validity of the assumption.

H. v. Zeipel, in the course of an article on stellar evolution in the December issue of *Scientia*, states that an attempt is being made at Upsala Observatory to obtain the relative masses of the giant stars of the different spectral types by a study of the grouping of these types in the globular clusters. He says: "One can demonstrate . . . that the massive stars congregate in relatively greater numbers than the light ones towards the middle of the group. By careful study of the distribution of the different types, one can deduce the mass of each." The detailed results are not given.